

Claims

1. A pipe-cleaning device (1) comprising a cutting head (2) for cutting away material on the interior of a pipe, a body (111) on which the cutting head is rotatably mounted and drive means (3, 4) for driving the rotation of the cutting head (2) with respect to the body (111), the body (111) having a circumference where support means (112) are mounted for supporting the body (111) on the interior (W) of a pipe, the support means (112) being provided over substantially the entire length of the body (111), characterised in that the cutting head (2) is provided with one or more collapsible cutting elements (21), which extend in radial direction of the cutting head (2) and are inwardly collapsible with respect to the circumference of the body (111), and that the support means (112) are formed by a plurality of arrays of collapsible support elements (30) extending in longitudinal direction of the body (111), the collapsible support elements (30) being inwardly collapsible with respect to the circumference of the body against the action of a resilient member (33).

2. A pipe-cleaning device according to claim 1, characterised in that each collapsible support element (30) comprises a wheel (31) which is rotatably mounted about a rotation axis on a collapsible arm (34), the arm being pivotally mounted about a pivot axis (113) on the body (111), the rotation axis being offset from the pivot axis in longitudinal direction of the body (111).

3. A pipe-cleaning device according to claim 2, characterised in that the resilient member (33) is a pull spring which extends in line with the collapsible arm (34) in unloaded state.

4. A pipe-cleaning device according to any one of the claims 1-3, characterised in that the body (111) has a front end at which the cutting head (2) is mounted and a rear end opposite the front end, the collapsible support elements (30) at the front end being

collapsible towards the rear end and the collapsible support elements (30) at the rear end being collapsible towards the front end.

5 5. A pipe-cleaning device according to any one of the claims 1-4, characterised in that the support means (112) are formed by at least three arrays of at least three collapsible support elements (30), the arrays being located at regular locations on the circumference of the body (111).

10 6. A cutting head (2), rotatably mountable on a pipe-cleaning device (1) for cutting away material on the interior of a pipe, characterised in that the cutting head (2) comprises at least one first collapsible cutting element (21) which extends radially from a rigid central part (11), each first collapsible cutting element (21) ending in a first cutting block (22) and being provided with at least one mass increasing element (22) at an intermediate location between the central part (11) and the first
15 cutting block (22).

7. A cutting head according to claim 6, characterised in that each mass increasing element (22) is formed by a second cutting block.

20 8. A cutting head according to claim 6 or 7, characterised in that the first collapsible cutting element (21) comprises a first chain part from the first cutting block to the mass increasing element and a second chain part from the mass increasing element to the central part (11), the first chain part having a weight which is smaller than or equal to that of the second chain part.

25 9. A cutting head according to any one of the claims 6-8, characterised in that the cutting head (2) further comprises at least one second collapsible cutting element in front of the at least one first collapsible cutting element, each second collapsible cutting element being of equal length or shorter than each first collapsible cutting element.

30 10. A cutting head according to claim 9, characterised in that each second collapsible cutting element comprises a

third chain part ending in a third cutting block, the third chain part being of substantially equal length with the second chain part of the first collapsible cutting elements.

5 11. A cutting head according to any one of the claims 6-10, characterised in that at least one of the first, second and/or third cutting blocks (22) is provided with a cutting protrusion (23) which extends in forwards direction from the cutting block.

10 12. A drive (3, 4) for driving a rotatable cutting head (2) of a pipe-cleaning device (1) for cutting away material on the interior of a pipe, the drive comprising a stator (3) and a rotor (4) which is rotatably mounted on the stator (3) about a rotation axis (9), the stator having at least one nozzle (7) connected to a supply duct (100) for directing a liquid stream of a pressurised liquid supplied via the supply duct successively onto a plurality of drive elements (5) of the rotor (4),
15 characterised in that the at least one nozzle (7) extends substantially within a plane (V) perpendicular to the rotation axis (9) of the rotor and that the at least one nozzle (7) is located inwardly from the rotor (4).

20 13. A drive according to claim 12, characterised in that each drive element (5) of the rotor (4) has a drive plane (6) for periodically receiving the liquid stream, the drive plane (6) being directed such that the liquid stream is received in a substantially perpendicular direction (P).

25 14. A drive according to claim 13, characterised in that the drive elements (5) during operation travel along a circular path and that each drive plane (6) is directed in an angle α of 20-70° with respect to this circular path.

30 15. A drive according to claim 14, characterised in that each nozzle (7) is directed in an angle β of 45-90° with respect to the circular path of the drive elements (5).

16. A drive according to any one of the claims 13-15, characterised in that each drive element (5) has a leading edge (8)

which is rotated first into the liquid stream of the nozzle (7) during operation, the leading edge (8) being bevelled in a direction towards the drive plane (6) of the in rotation direction previous drive element (5) of the rotor (4).

5 17. A drive according to claim 16, characterised in that the distance (x) between the nozzle (7) and the leading edge (8) of the drive elements is within the range of 1-5 mm.

10 18. A pipe-cleaning device (1) according to any one of the claims 1-5 having a cutting head (2) according to any one of the claims 6-11 and/or a drive (3, 4) according to any one of the claims 12-17.